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ROCCO S BARRESE  
DILWORTH & BARRESE  
333 EARLE OVINGTON BLVD  
UNIONDALE, NY 11553

EXAMINER

KIM, DAVID S

ART UNIT PAPER NUMBER

2633

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/232,119

Applicant(s)

WEITZEL, THILO

Examiner

David S. Kim

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-52 is/are pending in the application.
- 4a) Of the above claim(s) 24-26, 29, 31, 32, 35-37, 46-49, 51 and 52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-23, 27, 28, 30, 33, 34, 38-45 and 50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION*****Election/Restrictions***

1. Applicant's election without traverse of the species that corresponds to Fig. 2 in the reply filed on 19 July 2004 is acknowledged. In the same reply, Applicant stated that claims 21-24, 27-28, 30-34, 38-45, and 50 all read on upon the elected embodiment of Fig. 2. However, Examiner respectfully disagrees with this designation of claims and observes that claims 24 and 31-32 do not read on Fig. 2. In particular, note the following:

**Regarding claim 24**, the limitation "a local light source" does not read on the elected embodiment of Fig. 2. Fig. 2 lacks a local light source.

**Regarding claim 31**, the limitation "wherein the wavelength-dependent element is simultaneously at least one of

(a) a frequency shifter, or frequency modulator,

(b) a phase shifter or phase modulator"

does not read on the elected embodiment of Fig. 2. Rather, a prism 12 is shown, but it is not shown to function as a frequency shifter, a frequency modulator, a phase shifter, or a phase modulator.

**Regarding claim 32**, the limitation "an acousto-optical modulator" is not shown in Fig. 2.

Accordingly, Examiner does not consider the merits of claims 24 and 31-32. Rather, Examiner considers claims 21-23, 27-28, 30, 33-34, 38-45, and 50 to read on the elected embodiment of Fig. 2. Examiner treats **claims 21-23, 27-28, 30, 33-34, 38-45, and 50 on their merits** in this Office Action.

2. **Claims 24-26, 29, 31-32, 35-37, 46-49, and 51-52 are withdrawn** from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 19 July 2004.

***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following limitations must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

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(claims 22, 23, 43, 45) “a *coupler* structured and arranged to couple out a resulting signal from said interference;

*the coupler* is structured and arranged to make the thus coupled-out signal dependent upon at least one of time (amplitude modulation) or spatial modulation of intensity with reference to at least part of cross-section of the resulting interference signal.” Such a coupler is not shown.

(claim 23) “wherein said generating means include a beam splitter and *at least one of a frequency shifter or modulator*, a phase shifter or modulator, and a travel distance.” The phrase “at least one of” includes the case of the inclusion of the various shifters, modulators, and travel distance *all together*. Such a case is not shown. Also, said generating means including a frequency shifter or modulator is not shown.

(claim 34) “the wavelength-dependent element is structured and arranged to be at least one of rotatable or tiltable.” Fig. 2 shows prism 12 as the wavelength-dependent element, but prism 12 is not shown to be rotatable or tiltable.

(claim 39) “means structured and arranged for providing at least one of *spectral filtration*, and spatial modulation of at least one of phase and *amplitude* of at least one of said rays involved.” Spectral filtration is not shown. Also, spatial modulation of amplitude is not shown.

(claim 41) “A device in accordance with claim 21, which is an optical receiver or *optical modulator*, or *spectrometer*.” An optical modulator is not shown. Also, a spectrometer is not shown.

(claim 50) “a source of a reference light ray.” Such a source is not shown.

4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New

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Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

5. The disclosure is objected to because of the following informalities:

On p. 7, l. 1, “adjust the wavelength” is used where -- select the wavelength -- may be intended. Typically, a wavelength is not adjusted by the turning of the elements of Applicant’s disclosure (e.g., prisms, gratings, thin films, mirrors). However, another portion of the specification discusses the *selection* of a single channel (i.e., wavelength) of a WDM system (p. 4, 1<sup>st</sup> full paragraph).

On p. 8, last full paragraph, “modulation of...wavelength” is used where -- modulation of...frequency -- may be intended. This last full paragraph discusses various modulation schemes, such as modulation of amplitude and relative phase position. Although wavelength does correspond inversely to frequency, “modulation of frequency” (i.e., frequency modulation) is the standard terminology used. Although “modulation of wavelength” may be technically permissible, it is extremely uncommon.

On p. 10, l. 5, “adjust the wavelength” is used where -- select the wavelength -- may be intended. Typically, a wavelength is not adjusted by the pivoting of a mirror. However, another portion of the specification discusses the *selection* of a single channel (i.e., wavelength) of a WDM system (p. 4, 1<sup>st</sup> full paragraph).

On p. 10, 2<sup>nd</sup> paragraph, “adjust the wavelength” is used where -- select the wavelength -- may be intended. Typically, a wavelength is not adjusted by the pivoting of a mirror. However, another portion of the specification discusses the *selection* of a single channel (i.e., wavelength) of a WDM system (p. 4, 1<sup>st</sup> full paragraph).

On p. 11, l. 1, “adjust the wavelength” is used where -- select the wavelength -- may be intended. Typically, a wavelength is not adjusted by the pivoting of a mirror. However, another portion of the specification discusses the *selection* of a single channel (i.e., wavelength) of a WDM system (p. 4, 1<sup>st</sup> full paragraph).

Appropriate correction is required.

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6. The abstract of the disclosure is objected to because of its undue length. Correction is required.

See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of **50 to 150 words**. It is important that the abstract not exceed **150 words** in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### ***Claim Objections***

7. **Claims 21-22, 34, 38, and 40** are objected to because of the following informalities:

In claims 21-22, 34, 38, and 40, note the following limitation:

"wherein a wavelength-dependent element is structured and arranged to change angle(s) of at least one of the optical signals and reference rays being brought into interference depending upon wavelength."

In this limitation, "reference rays" is used where -- reference ray(s) -- may be intended. Notice the antecedent basis instances of reference "ray(s)."

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. **Claims 21-23, 27-28, 30, 33-34, and 38-45** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Note the following limitations in independent claims 21, 22, 34, 38, and 40:

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“means structured and arranged for generating at least one reference light ray which has at least one of

- (i) frequency shift or frequency modulation or both;
- (ii) phase shift or phase modulation or both;
- (iii) time displacement, over the optical signal to be detected.”

Notice that the phrase “at least one of” includes the case of the inclusion of (i), (ii), and (iii) *all together*. The specification does not disclose such a case, and the original version of the claims did not disclose such a case, either. Accordingly, claims 21-23, 27-28, 30, 33-34, and 38-45 contain new matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

10. **Claims 22-23, 43, and 45** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Notice the following limitation in independent claim 22:

“the coupler is structured and arranged to make the thus coupled-out signal dependent upon at least one of time (amplitude modulation) or spatial modulation of intensity with reference to at least part of cross-section of the resulting interference signal.”

Typically, a coupler is not known to *make* a coupled out signal dependent upon time or spatial modulation of intensity. Rather, a coupler generally serves a medium or a conduit for a signal to pass from one location to another, without *making* that signal dependent upon time, spatial, or any other kind of particular modulation of intensity. The application does not disclose such a particular *making* or an enabling disclosure for such *making*. Thus, without further teachings about such *making*, one of ordinary skill in the art would require undue experimentation to attempt such *making*. Accordingly, the claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention.

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11. **Claim 23** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Note the following limitation:

“wherein said generating means include a beam splitter and at least one of a frequency shifter or modulator, a phase shifter of modulator, and a travel distance.”

The phrase “at least one of” includes the case of the inclusion of the various shifters, modulators, and travel distance *all together*. The specification does not disclose such a case, and the original version of the claims (i.e., see original claim 3) did not disclose such a case, either. Accordingly, claim 23 contains new matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

12. **Claims 44-45** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Notice the following limitation in claims 44-45:

“another mirror (30) pivotally provided to adjust the wavelength to be detected.”

It appears that “adjust the wavelength” is used where -- select the wavelength -- may be intended. Typically, a wavelength is not adjusted by the pivoting of a mirror. However, another portion of the specification discusses the *selection* of a single channel (i.e., wavelength) of a WDM system (p. 4, 1<sup>st</sup> full paragraph). Without further teaching on how mirror 30 is provided to adjust the actual wavelength to be detected, one of ordinary in the art would require undue experimentation to attempt to make and use such a mirror. Accordingly, the claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention.



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13. **Claim 50** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Notice the following limitation in claim 50:

“a second mirror (30)...to reflect back and adjust wavelength of a signal to be detected.”

It appears that “adjust the wavelength” is used where -- select the wavelength -- may be intended. Typically, a wavelength is not adjusted by the pivoting of a mirror. However, another portion of the specification discusses the *selection* of a single channel (i.e., wavelength) of a WDM system (p. 4, 1<sup>st</sup> full paragraph). Without further teaching on how mirror 30 is provided to adjust the actual wavelength to be detected, one of ordinary in the art would require undue experimentation to attempt to make and use such a mirror. Accordingly, the claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention.

14. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15. **Claims 21-23, 27-28, 30, 33-34, and 38-45** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Note the following limitations in independent claims 21, 22, 34, 38, and 40:

“means structured and arranged for generating at least one reference light ray which has at least one of

(i) frequency shift or frequency modulation or both;

(ii) phase shift or phase modulation or both;

(iii) time displacement, over the optical signal to be detected.”

Notice the use of the phrase “at least one of” with regard to (i), (ii), and (iii). On one hand, does the phrase “at least one of” mean at least one of (i), (ii), and (iii)? On the other hand, does the phrase

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mean at least one of frequency shift, frequency modulation, both frequency shift and modulation, phase shift, phase modulation, both phase shift and modulation, and time displacement? Such confusion about the claimed subject matter indicates that the claim language is indefinite.

16. **Claims 21-23, 27-28, 30, 33-34, and 38-45** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Notice the following limitation in independent claims 21, 22, 34, 38, and 40:

“time displacement, over the optical signal to be detected.”

The meaning of “over the optical signal to be detected” is unclear. How does a reference light ray have time displacement *over* another optical signal? How does one displace time of a reference light ray *over* another optical signal? The language of this limitation seems so awkward that the meaning of this limitation is indefinite. Perhaps, Applicant means that a reference light ray is displaced in time, relative to another optical signal? Perhaps, Applicant means that the temporal position of a reference light ray is displaced in time, relative to the temporal position of another optical signal?

17. **Claim 30** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Notice the following limitation:

“wherein the wavelength-dependent element is structured and arranged to have a modifiable wavelength dependency of the deflection angle.”

First of all, there is no antecedent basis for “the deflection angle.” Second, one can read “a modifiable wavelength dependency of the deflection angle” with two different interpretations. In one reading, the *wavelength* is modifiable. In another reading, the wavelength *dependency* is modifiable. Third, “a modifiable wavelength dependency of the deflection angle” reads quite awkwardly. See original claim 8 for comparison.

18. **Claim 50** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Notice the following limitations in claim 50:

“a source of a reference light ray,

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a beam splitter (10) positioned downstream of said source to receive the reference light ray and split the same into two partial rays”

Notice the corresponding limitations in claims 21-22:

“means (10, 11, 20, 80) structured and arranged for generating at least one reference light ray.”

Claim 50 appears to designate a separate source of a reference light ray and a separate beam splitter 10 to *receive* the reference light ray. Claims 21-22 appear to designate beam splitter 10 to *generate* the reference light ray so that the beam splitter 10 is the source of the reference light ray. This discrepancy between these two sets of claims raises some questions. In claims 21-22, what is the reference light ray? Is it the input ray into beam splitter 10? Is it one of the split rays output from beam splitter 10? Conversely, in claim 50, what is the source of the reference light ray? Is it a separate source that is not shown in Fig. 2? Is it beam splitter 10?

Additionally, notice the following limitation in claim 50:

“a first mirror (20)...comprising means for shifting the same”

This first mirror 20 *itself* does not comprise *more* means. Rather, see claims 44-45 that simply disclose “a mirror (20) and means for shifting the same.” As a remedy, Examiner suggests removing the term “comprising” from this limitation in claim 50.

### ***Claim Rejections - 35 USC § 102***

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. **Claims 21, 27-28, 30, 33, 38-39, and 41-42** are rejected under 35 U.S.C. 102(b) as being anticipated by Mertz (U.S. Patent No. 3,469,923) and Hecht et al. (*Optics*, hereinafter “Hecht”).

**Regarding claim 21**, Mertz and Hecht disclose:

A device for detecting optical signals, comprising  
means (Mertz, beam splitter 23 in Fig. 5) structured and arranged for generating at least one reference light ray which has at least one of

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(i) frequency shift or frequency modulation or both;

(ii) phase shift or phase modulation or both; and

(iii) time displacement (Mertz, relative displacement in time between the signal exiting up from 23 and the signal exiting right from 23), over the optical signal to be detected;

means (Mertz, mirrors 27 and 33) structured and arranged for aligning at least one of the signals and reference light ray(s) such that they can be brought into interference; and

a detector (Mertz, photomultiplier 35) with a demodulator (Mertz, synchronous demodulator 38) being structured and arranged to detect amplitude modulation (Mertz, changes in amplitude in col. 2, l. 29-53; modulation of line 10 in col. 4, l. 63-69; fringe pattern in col. 6, l. 65-70) of a resulting signal from said interference;

wherein a wavelength-dependent (not shown in Mertz but note that Hecht shows compensating plates to be made from glass, p. 287, bottom of col. 1; Hecht shows that glass has an index of refraction  $n$  greater than 1, p. 189-190; Hecht also shows that  $n$  is frequency/wavelength-dependent, p. 38, top of col. 2) element (Mertz, compensating plate 24) is structured and arranged to change angle(s) (not shown in Mertz but shown in the compensating plate *C* of Hecht, p. 287, Fig. 9.12) of at least one of the optical signals and reference rays being brought into interference depending upon wavelength; and

said detector (Mertz, photomultiplier 35) is structured and arranged to measure at least one of time and spatial modulation of intensity of at least part of cross-section (Hecht, cross-section on detector *D* in Fig. 9.12, p. 287; Mertz, fringe pattern in col. 6, l. 65-70) of the resulting detected signal.

**Regarding claim 27, Mertz and Hecht disclose:**

A device in accordance with claim 21, wherein the wavelength-dependent element is a dispersing optical element (Hecht, light experiences dispersion in the glass of the compensating plate, p. 38, top of col. 2).

**Regarding claim 28, Mertz and Hecht disclose:**

A device in accordance with claim 27, wherein said dispersing optical element is a prism (Mertz, compensating plate 24).

**Regarding claim 30, Mertz and Hecht disclose:**

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A device in accordance with claim 21, wherein the wavelength-dependent element is structured and arranged to have a modifiable wavelength dependency of the deflection angle (Hecht teaches (a) index of refraction  $n$  is frequency/wavelength-dependent, p. 38, top of col. 2; (b) deflection angle is described by Snell's Law, eq. 4.5, p. 63; and (c) Snell's Law is a function of index  $n$ ; thus, the deflection angle is modifiable by its dependency on the wavelength of the incident light).

**Regarding claim 33**, Mertz and Hecht disclose:

A device in accordance with claim 21, additionally comprising means for deflecting (e.g., glass plate 32 reflects at least some of its incident signal) at least one of the reference light ray and optical signal.

**Regarding claim 38**, claim 38 is an apparatus claim that corresponds largely to the apparatus claim 21. Therefore, the recited means in apparatus claim 21 read on the corresponding means in apparatus claim 38. Claim 38 also includes limitations absent from claim 21. Mertz and Hecht also disclose these limitations:

additionally comprising means (Mertz, lens 36) structured and arranged for changing the ray cross-section of at least one of the rays involved.

**Regarding claim 39**, claim 39 is an apparatus claim that corresponds largely to the apparatus claim 21. Therefore, the recited means in apparatus claim 21 read on the corresponding means in apparatus claim 39. Claim 39 also includes limitations absent from claim 21. Mertz and Hecht also disclose these limitations:

additionally comprising means structured and arranged for providing at least one of spectral filtration, and spatial modulation of at least one of phase (Mertz, displacement of mirror 27) and amplitude of at least one of said rays involved.

**Regarding claim 41**, Mertz and Hecht disclose:

A device in accordance with claim 21, which is an optical receiver (Mertz, Fig. 5 receives optical signal 26) or optical modulator (Mertz, Fig. 5 modulates an optical signal via displacing mirror 27), or spectrometer (Mertz, Fig. 5 measures spectral characteristics via photomultiplier 35, spectrographic purposes in col. 3, l. 10-11).

**Regarding claim 42**, Mertz and Hecht disclose:

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A device in accordance with claim 21, omitting a local oscillator (Mertz, Fig. 5 lacks a local oscillator).

***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. **Claims 34 and 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mertz and Hecht.

**Regarding claim 34**, claim 34 is an apparatus claim that corresponds largely to the apparatus claim 21. Therefore, the recited means in apparatus claim 21 read on the corresponding means in apparatus claim 34. Claim 34 also includes limitations absent from claim 21. These limitations are:

the wavelength-dependent element is structured and arranged to be at least one of rotatable or tiltable.

Mertz and Hecht do not expressly disclose these limitations. However, Examiner notes that one of ordinary skill in the art would have recognized that it is technically trivial to rotate or tilt the compensating plate 24 of Mertz. One simply rotates or tilts it. Accordingly, the compensating plate 24 of Mertz and Hecht would be rotatable or tiltable.

**Regarding claim 40**, claim 40 is an apparatus claim that corresponds largely to the apparatus claim 21. Therefore, the recited means in apparatus claim 21 read on the corresponding means in apparatus claim 40. Claim 40 also includes limitations absent from claim 21. These limitations are:

the wavelength-dependent element is structured and arranged to be at least one of rotatable or tiltable.

additionally comprising at least one of (a) and (b):

(a) wave guides structured and arranged such that at least part of the rays involved are guided at least partially therethrough; and

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(b) at least part of the wavelength-dependent element being formed by integrated optics.

Mertz and Hecht do not expressly disclose these limitations. However, Examiner notes that the integration of optics is an extremely well known practice in the art. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to form the wavelength-dependent element by integrated optics. One of ordinary skill in the art would have been motivated to do this for some conventional benefits of integration, such as reduced manufacturing costs, smaller apparatus size, and higher apparatus stability.

***Allowable Subject Matter***

23. The indicated allowability of **claim 50** is withdrawn in view of the newly presented grounds of rejection under 35 U.S.C. 112, 1<sup>st</sup> paragraph.

24. At the time of this Office Action, Examiner would consider Applicant's independent claims to be allowable if it further included the following concepts embodied in claim language that is acceptable to Applicant (and if the standing 35 U.S.C. 112 issues for Applicant's independent claims were resolved):

- said device receiving a wavelength-division multiplexed (WDM) communication signal that carries phase-modulated or frequency-modulated data, said WDM communication signal further comprising a plurality of communication channels, each channel respectively designated by a corresponding wavelength;
- said aligning means and said wavelength-dependent element are structured and arranged to select one channel of said plurality of communication channels for said detector to detect by selecting said one channel's corresponding wavelength from the plurality of wavelengths and directing said one channel's corresponding wavelength to said detector;
- said detector with said demodulator being structured and arranged to demodulate data from the selected one channel.

Examiner's most recent search did not discover such an invention. However, even if Applicant incorporated the concepts above into Applicant's independent claims, a final determination of allowability would be subject to an updated search.

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***Conclusion***

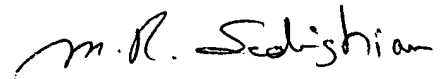
25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Barringer and Doyle are cited to show Michelson-type interferometers with structures that are similar to the structure of Applicant's invention (elected Fig. 2). Epworth, Shirasaki, Blodgett et al., and Erskine are cited to show Michelson-type interferometers that are used for transmission and reception of optical communication signals. Laskoskie et al. and Reasenberget al. are cited to show the use of lock-in amplifiers with Michelson-type interferometers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DSK

  
**M. R. SEDIGHIAN**  
**PRIMARY EXAMINER**